

CLAIMS

1. A holographic recording medium in which two-dimensional information pages each having multiple pixels are
5 multiplexed and holographically recorded, wherein:

address pixel and data pixel signals are recorded in each of the two-dimensional information pages;

a plurality of pixels in the two-dimensional information page form the address pixels, and a set of the address pixels
10 forms an address information region;

the address information region is disposed at a different position in the two-dimensional information page on a two-dimensional information page basis or on a page group basis comprising a plurality of two-dimensional information pages;

15 and

the pixels outside the address information region disposed in the two-dimensional information page form a data region in which two-dimensional information is recorded as the data pixels.

20 2. The holographic recording medium according to claim 1, wherein

the set of the address pixels and a set of pixels similar to the set of the address pixels in the data region differ from each other in at least either on-pixel ratio or on-pixel
25 arrangement.

3. The holographic recording medium according to claim 2,
wherein

the address information region differs from the data
region in on-pixel ratio.

5 4. The holographic recording medium according to claim 3,
wherein

the on-pixel ratio of the data region is set to 50%, and
the on-pixel ratio of the address information region is set to
less than or more than 50%.

10 5. The holographic recording medium according to claim 3
or 4, wherein

the address information region comprises a pixel block
including a set of at least nine address pixels, and all the
address pixels in the pixel block are set to on or off state.

15 6. The holographic recording medium according to any one
of claims 1 to 4, wherein

the address information regions are disposed at an
identical position in an identical page group, and each of the
address information regions in the identical page group has a
20 different on or off pixel arrangement in each of the two-
dimensional information pages.

7. A method for adding address information to a
holographic recording medium capable of recording by
interference between reference and information beams, wherein,
25 when recording two-dimensional information pages each

comprising multiple pixels into the holographic recording medium, an address information region comprising a set of address pixels formed by a plurality of pixels is formed at a different position in the two-dimensional information page on
5 a two-dimensional page basis or on a page group basis comprising a plurality of two-dimensional information pages, and two-dimensional information is given to a data region comprising pixels outside the address information region disposed in the two-dimensional information page to perform
10 holographic recording.

8. The method for adding address information to a holographic recording medium according to claim 7, wherein
address information is holographically recorded such that the set of address pixels and a set of pixels similar to the
15 set of address pixels in the data region differ from each other in at least either on-pixel ratio or on-pixel arrangement.

9. The method for adding address information to a holographic recording medium according to claim 8, wherein
20 the on-pixel ratio of the data region is set to 50%, and the on-pixel ratio of the address information region is set to less than or more than 50%.

10. The method for adding address information to a holographic recording medium according to claim 8 or 9,
25 wherein

the address information region comprises address pixels, and all the address pixels are set as on or off pixels.

11. The method for adding address information to a holographic recording medium according to any one of claims 7

5 to 10, wherein

the address information regions are disposed at an identical position in an identical page group, and the address information regions in the identical page group have different on-pixel arrangements on a two-dimensional information page

10 basis.

12. The method for adding address information to a holographic recording medium according to any one of claims 7 to 11, wherein

the address pixel and the data pixel forming each of the two-dimensional information pages are displayed by pixels in a spatial light modulator disposed on an optical path of the information beam.

13. A method for addressing a holographic recording medium in which: two-dimensional information pages each comprising multiple pixels are multiplexed and holographically recorded by using interference between reference and information beams; an address information region comprising a set of address pixels formed by a plurality of pixels selected from among the pixels and a data region comprising the remaining pixels and capable of recording two-dimensional

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information are provided in each of the two-dimensional information pages; and the address information region is disposed at a different position in the two-dimensional information page on a two-dimensional information page basis or on a page group basis comprising a plurality of two-dimensional information pages, wherein

5 a target two-dimensional information page is detected by an amount of light from the address information region among diffraction light generated by irradiating a reference or search beam to the holographic recording medium.

14. The method for addressing a holographic recording medium according to claim 13, wherein

the data region is recorded with an on-pixel ratio of 50%, the address information region is recoded with an on-pixel ratio of less than or more than 50%, and the address information region is detected by a difference between the amounts of the diffraction light in the data region and the address information region.

15. The method for addressing a holographic recording medium according to claim 13 or 14, wherein

the reference or search beam is concentrated within the range of the address information region in a target two-dimensional information page, and sequentially illuminates each two-dimensional information page, thereby detecting the target two-dimensional information page by the diffraction

light generated when the region illuminated by the reference or search beam matches the address information region.

16. The method for addressing a holographic recording medium according to any one of claims 13 to 15, wherein

5 the address information regions are recorded in a form of on-pixel arrangements that differ from one another on a two-dimensional information page basis or on a two-dimensional information page basis in an identical page group, and a target two-dimensional information page is detected according
10 to the on-pixel arrangement after the position of the address information region in the two-dimensional information page has been detected.

17. A holographic recording and reproducing apparatus for reproducing two-dimensional information in a holographic
15 recording medium in which: two-dimensional information pages each comprising multiple pixels are multiplexed and holographically recorded; address and data pixel signals are recorded in each of the two-dimensional information pages; a plurality of pixels in the two-dimensional information page
20 form the address pixels, and a set of the address pixels forms an address information region; the address information region is disposed at a different position in the two-dimensional information page on a two-dimensional information page basis or on a page group basis comprising a plurality of two-
25 dimensional information pages; and pixels outside the address

information region disposed in the two-dimensional information page form a data region in which the two-dimensional information is recorded as the data pixels, the holographic recording and reproducing apparatus comprising:

5 a reference optical system for splitting a laser beam by using a beam splitter into an object beam and a reference beam and irradiating the reference beam to the holographic recording medium;

 a search optical system for irradiating the object beam
10 as a search beam to the holographic recording medium;

 a spatial light modulator provided in an optical path of the search optical system and modulating the object beam to the search beam so as to sequentially illuminate each two-dimensional page;

15 a light detector for receiving diffraction light generated from the holographic recording medium by the illumination of the search beam; and

 a control unit for detecting a target two-dimensional information page by an output of the light detector,

20 wherein the spatial light modulator comprises multiple pixels capable of describing the two-dimensional information page, and narrows down the object beam to a range corresponding to the pixels of the address information region to modulate to the search beam.

25 18. The holographic recording and reproducing apparatus

according to claim 17, wherein

the address information regions in the two-dimensional information pages recorded in the holographic recording medium are recorded in a form of on-pixel ratios that differ from one another on a two-dimensional information page basis or on a two-dimensional information page basis in an identical page group, and the control unit detects the on-pixel ratio of an address information region from the output of the light detector obtained when the address information region matches the search beam region in the spatial light modulator, thereby detecting a target two-dimensional information page.